Drinking water supply through rusted pipelines

1328. SHRI NANDI YELLAIAH: Will the Minister of URBAN DEVELOPMENT AND POVERTY ALLEVIATION be pleased to state:

(a) whether it is a fact that drinking water supplied through ageing and rusted pipelines can result in long-term illnesses including liver damage;

(b) if so, whether it is also a fact that in a large number of cities including a major part of the capital drinking water pipelines have become more than 50 years old;

(c) if so, the names of the cities where such old water lines are still being used and the reason for not replacing them with new pipelines; and

(d) the details of the steps being taken/proposed to be taken by Government to remove this health hazard?

THE MINISTER OF STATE IN THE MINISTRY OF URBAN DEVELOPMENT AND POVERTY ALLEVIATION (SHRI O. RAJAGOPAL): (a) World Health Organisation (WHO) in its Guidelines for Drinking Water Quality, Second edition, volume-I, published in 1993 has indicated that no health-based guidelines value for iron in drinking water is proposed. The relevant information about presence of iron in water and impact on health etc. is attached as Statement (*See* below). There is usually no noticeable taste at iron concentrations below 0.3 mg/litre, although turbidity and colour may develop. Iron concentrations of 1—3 mg/litre can be acceptable for people drinking anaerobic well water.

(b) and (c) Since water supply is a State subject, water supply systems are planned, designed, executed, operated and maintained by the State/U.T. Water Supply Department/Urban Local Bodies. Therefore, data in regard to cities with water pipelines more than 50 years old are not available in this Ministry.

(d) It is the responsibility of the State/UT Governments and Urban Local Bodies to conduct detailed surveys city/town-wise to ascertain the internal condition of metallic pipelines and the quality of water conveyed through such pipelines to detect rusting and its presence in drinking water over and above the recommended guideline value and take remedial measures.

Statement

Extracts taken from guidelines For drinking water quality (Second Edition), Volume 1 Recommendations, World Health Organisation, Geneva 1993.

Iron

Iron is one of the most abundant metals in the earth's crust. It is found in natural fresh waters at levels ranging from 0.5 to 50 mg/litre. Iron may also be present in drinking water as a result of the use of iron coagulants or the corrosion of steel and cast iron pipes during water distribution.

Iron is an essential element in human nutrition. Estimates of minimum daily requirement for iron depend on age, sex, physiological status, and iron bio-availability and range from about 10 to 50 mg/day.

As a precaution against storage in the body of excessive iron, in 1983, JECFA established a provisional maximum tolerable daily intake (PMTDI) of 0.8 mg/kg. of body weight, which applies to iron from all sources except for iron oxides used as colouring agents, and iron supplements taken during pregnancy and lactation or for specific clinical requirements. An allocation of 10% of this PMTDI to drinking water gives a value of about 2 mg/litre which does not present a hazard to health. The taste and appearance of drinking water will usually be affected below this level.

Anaerobic ground water may contain ferrous iron at concentration of upto several milligrams per litre without discoloration or turbidity in water when directly pumped from a well. On exposure to the atmosphere, however, the ferrous iron oxidizes to ferric iron, giving an objectionable reddish-brown colour to the water.

Iron also promotes the growth of "iron bacteria", which derive their energy from the oxidation of ferrous iron to ferric iron and in the process deposit a slimy coating on the piping.

At levels above 0.3 mg/litre, iron stains laundry and plumbing fixtures. There is usually no noticeable taste at iron concentrations below 0.3 mg/litre although turbidity and colour may develop. Iron concentrations of 1—3 mg/litre can be acceptable for people drinking anaerobic well-water.

No health-based guideline value is proposed for iron.